



SEQUENCE LISTING

<110> Boehringer Ingelheim International GmbH

<120> Method for Identifying Compounds Modulating Sister Chromatid Separation

<130> 0652.2290001

<140> US 10/051,311

<141> 2002-01-22

<150> US 60/297,440

<151> 2001-06-13

<150> EP 01 101 252.3

<151> 2001-01-19

<160> 13

<170> PatentIn Ver. 2.1

<210> 1

<211> 6668

<212> DNA

<213> Homo sapiens

<220>

<221> 5'UTR

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<221> CDS

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ccttttccct agctctccgg tgtc atg agg agc ttc aaa aga gtc aac ttt 171

Met Arg Ser Phe Lys Arg Val Asn Phe

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ggg act ctg cta agc agc cag aag gag gct gaa gag ttg ctg ccc gac 219

Gly Thr Leu Leu Ser Ser Gln Lys Glu Ala Glu Glu Leu Leu Pro Asp

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ttg aag gag ttc ctg tcc aac cct cca gct ggt ttt ccc agc agc cga 267

Leu Lys Glu Phe Leu Ser Asn Pro Pro Ala Gly Phe Pro Ser Ser Arg

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tct gat gct gag agg aga caa gct tgt gat gcc atc ctg agg gct tgc 315

Ser Asp Ala Glu Arg Arg Gln Ala Cys Asp Ala Ile Leu Arg Ala Cys

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aac cag cag ctg act gct aag cta gct tgc cct agg cat ctg ggg agc 363

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Leu	Leu	Glu	Leu	Ala	Glu	Leu	Ala	Cys	Asp	Gly	Tyr	Leu	Val	Ser	Thr		
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cca	cag	cgt	cct	ccc	ctc	tac	ctg	gaa	cga	att	ctc	ttt	gtc	tta	ctg	459	
Pro	Gln	Arg	Pro	Pro	Leu	Tyr	Leu	Glu	Arg	Ile	Leu	Phe	Val	Leu	Leu		
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Gln	Pro	Leu	His	Ala	Cys	Leu	Val	Gln	Cys	Ser	Arg	Glu	Ala	Ala	Pro		
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Gly	Ala	Glu	Ala	Leu	Leu	Glu	Arg	Arg	Ala	Ala	Phe	Ala	Ala	Arg	Leu		
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Lys	Ala	Leu	Ser	Phe	Leu	Val	Leu	Leu	Glu	Asp	Glu	Ser	Thr	Pro	Cys		
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Glu	Val	Pro	His	Phe	Ala	Ser	Pro	Thr	Ala	Cys	Arg	Ala	Val	Ala	Ala		
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Asp	Phe	Leu	Asp	Asp	Leu	Leu	Ser	Arg	His	Val	Ile	Arg	Ala	Leu	Val		
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Gly	Glu	Arg	Gly	Ser	Ser	Ser	Gly	Leu	Leu	Ser	Pro	Gln	Arg	Ala	Leu		
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Cys	Leu	Leu	Glu	Leu	Thr	Leu	Glu	His	Cys	Arg	Arg	Phe	Cys	Trp	Ser		
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Arg	His	His	Asp	Lys	Ala	Ile	Ser	Ala	Val	Glu	Lys	Ala	His	Ser	Tyr		
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cta	agg	aac	acc	aat	cta	gcc	cct	agc	ctt	cag	cta	tgt	cag	ctg	ggg	1035	
Leu	Arg	Asn	Thr	Asn	Leu	Ala	Pro	Ser	Leu	Gln	Leu	Cys	Gln	Leu	Gly		
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Leu	Leu	Ile	Lys	Ala	Ser	Ala	Val	Leu	Ser	Lys	Ser	Met	Glu	Ala	Pro		
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Ser	Pro	Pro	Leu	Arg	Ala	Leu	Tyr	Glu	Ser	Cys	Gln	Phe	Phe	Leu	Ser		
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Arg	Asp	Asp	Gly	Val	Tyr	Gly	Gly	Ser	Ser	Lys	Gln	Gln	Gln	Ser	Phe		
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ctt	cag	atg	tac	ttt	cag	gga	ctt	cac	ctc	tac	act	gtg	gtg	gtt	tat	1371	
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Ser	Tyr	Thr	Ser	Asn	Leu	Ala	Tyr	Ser	Phe	Tyr	Ser	His	Lys	Leu	Tyr		
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gcc	gag	gcc	tgt	gcc	atc	tct	gag	ccg	ctc	tgt	cag	cac	ctg	ggt	ttg	1611	
Ala	Glu	Ala	Cys	Ala	Ile	Ser	Glu	Pro	Leu	Cys	Gln	His	Leu	Gly	Leu		
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Cys	Phe	Arg	Leu	Gln	Val	Glu	Ser	Leu	Lys	Lys	Leu	Gly	Lys	Gln	Ala		
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Arg Asp Ser Leu Ser Gly Trp Asp Pro Glu Thr Leu Ala Leu Leu Leu 570 575 580 585			
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ctg tgg ctt tac atc tgt act ctg gaa gcc aaa ata cag gaa ggt atc Leu Trp Leu Tyr Ile Cys Thr Leu Glu Ala Lys Ile Gln Glu Gly Ile 685 690 695			2235
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tac agt aac att gcc ttc aac ctg gct gca gat gct gct cag tcc aaa Tyr Ser Asn Ile Ala Phe Asn Leu Ala Ala Asp Ala Ala Gln Ser Lys 730 735 740 745			2379
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cag gcc cca gct gta cgg tgt ctc cag cag aca gca gcc tca ctg cag Gln Ala Pro Ala Val Arg Cys Leu Gln Gln Thr Ala Ala Ser Leu Gln 765 770 775			2475
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Gln	Leu	Val	Ala	Ala	Tyr	Leu	Ser	Leu	Pro	Ser	Asn	Asn	Leu	Ser	His		
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Lys	Thr	Lys	Pro	Gln	Pro	Ile	Pro	Asn	Phe	Leu	Ser	His	Ser	Pro	Thr		
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Cys	Asp	Cys	Ser	Leu	Cys	Ala	Ser	Pro	Val	Leu	Thr	Ala	Val	Cys	Leu		
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Ala	Tyr	Thr	Leu	Leu	Ala	Leu	Glu	Gly	Leu	Asn	Gln	Pro	Ser	Asn	Glu		
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Ser	Leu	Gln	Lys	Val	Leu	Gln	Ser	Gly	Leu	Lys	Phe	Val	Ala	Ala	Arg		
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ctg gaa ggt aga gga ctg ccc tgc aca cct aaa ccc cca gac cgg atc	4203
Leu Glu Gly Arg Gly Leu Pro Cys Thr Pro Lys Pro Pro Asp Arg Ile	
1340 1345 1350	
agg caa gct ggc cct cat gtc ccc ttc acg gtg ttt gag gaa gtc tgc	4251
Arg Gln Ala Gly Pro His Val Pro Phe Thr Val Phe Glu Glu Val Cys	
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cct aca gag agc aag cct gaa gta ccc cag gcc ccc agg gta caa cag	4299
Pro Thr Glu Ser Lys Pro Glu Val Pro Gln Ala Pro Arg Val Gln Gln	
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aga gtc cag acg cgc ctc aag gtg aac ttc agt gat gac agt gac ttg	4347
Arg Val Gln Thr Arg Leu Lys Val Asn Phe Ser Asp Asp Ser Asp Leu	
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Glu Asp Pro Val Ser Ala Glu Ala Trp Leu Ala Glu Glu Pro Lys Arg	
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cgg ggc act gct tcc cgg ggc cgg ggg cga gca agg aag ggc ctg agc	4443
Arg Gly Thr Ala Ser Arg Gly Arg Gly Arg Ala Arg Lys Gly Leu Ser	
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cta aag acg gat gcc gtg gtt gcc cca ggt agt gcc cct ggg aac cct	4491
Leu Lys Thr Asp Ala Val Val Ala Pro Gly Ser Ala Pro Gly Asn Pro	
1435 1440 1445	
ggc ctg aat ggc agg agc cgg agg gcc aag aag gtg gca tca aga cat	4539
Gly Leu Asn Gly Arg Ser Arg Arg Ala Lys Lys Val Ala Ser Arg His	
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tgt gag gag cgg cgt ccc cag agg gcc agt gac cag gcc agg cct ggc	4587
Cys Glu Glu Arg Arg Pro Gln Arg Ala Ser Asp Gln Ala Arg Pro Gly	
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cct gag atc atg agg acc atc cct gag gaa gaa ctg act gac aac tgg	4635
Pro Glu Ile Met Arg Thr Ile Pro Glu Glu Glu Leu Thr Asp Asn Trp	
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aga aaa atg agc ttt gag atc ctc agg ggc tct gac ggg gaa gac tca	4683

Arg Lys Met Ser Phe Glu Ile Leu Arg Gly Ser Asp Gly Glu Asp Ser	
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gcc tca ggt ggg aag act cca gct ccg ggc cct gag gca gct tct gga	4731
Ala Ser Gly Gly Lys Thr Pro Ala Pro Gly Pro Glu Ala Ala Ser Gly	
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gaa tgg gag ctg ctg agg ctg gat tcc agc aag aag aag ctg ccc agc	4779
Glu Trp Glu Leu Leu Arg Leu Asp Ser Ser Lys Lys Lys Leu Pro Ser	
1530	1535 1540 1545
cca tgc cca gac aag gag agt gac aag gac ctt ggt cct cgg ctc cag	4827
Pro Cys Pro Asp Lys Glu Ser Asp Lys Asp Leu Gly Pro Arg Leu Gln	
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ctc ccc tca gcc ccc gta gcc act ggt ctt tct acc ctg gac tcc atc	4875
Leu Pro Ser Ala Pro Val Ala Thr Gly Leu Ser Thr Leu Asp Ser Ile	
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tgt gac tcc ctg agt gtt gct ttc cgg ggc att agt cac tgt cct cct	4923
Cys Asp Ser Leu Ser Val Ala Phe Arg Gly Ile Ser His Cys Pro Pro	
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agt ggg ctc tat gcc cac ctc tgc cgc ttc ctg gcc ttg tgc ctg ggc	4971
Ser Gly Leu Tyr Ala His Leu Cys Arg Phe Leu Ala Leu Cys Leu Gly	
	1595 1600 1605
cac cgg gat cct tat gcc act gct ttc ctt gtc acc gag tct gtc tcc	5019
His Arg Asp Pro Tyr Ala Thr Ala Phe Leu Val Thr Glu Ser Val Ser	
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atc acc tgt cgc cac cag ctg ctc acc cac ctc cac aga cag ctc agc	5067
Ile Thr Cys Arg His Gln Leu Leu Thr His Leu His Arg Gln Leu Ser	
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aag gcc cag aag cac cga gga tca ctt gaa ata gca gac cag ctg cag	5115
Lys Ala Gln Lys His Arg Gly Ser Leu Glu Ile Ala Asp Gln Leu Gln	
	1645 1650 1655
ggg ctg agc ctt cag gag atg cct gga gat gtc ccc ctg gcc cgc atc	5163
Gly Leu Ser Leu Gln Glu Met Pro Gly Asp Val Pro Leu Ala Arg Ile	
	1660 1665 1670
cag cgc ctc ttt tcc ttc agg gct ttg gaa tct ggc cac ttc ccc cag	5211
Gln Arg Leu Phe Ser Phe Arg Ala Leu Glu Ser Gly His Phe Pro Gln	
	1675 1680 1685
cct gaa aag gag agt ttc cag gag cgc ctg gct ctg atc ccc agt ggg	5259
Pro Glu Lys Glu Ser Phe Gln Glu Arg Leu Ala Leu Ile Pro Ser Gly	
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gtg act gtg tgt gtg ttg gcc ctg gcc acc ctc cag ccc gga acc gtg	5307
Val Thr Val Cys Val Leu Ala Leu Ala Thr Leu Gln Pro Gly Thr Val	
	1710 1715 1720
ggc aac acc ctc ctg ctg acc cgg ctg gaa aag gac agt ccc cca gtc	5355
Gly Asn Thr Leu Leu Thr Arg Leu Glu Lys Asp Ser Pro Pro Val	
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agt gtg cag att ccc act ggc cag aac aag ctt cat ctg cgt tca gtc	5403

Ser Val Gln Ile Pro Thr Gly Gln Asn Lys Leu His Leu Arg Ser Val	
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ctg aat gag ttt gat gcc atc cag aag gca cag aaa gag aac agc agc	5451
Leu Asn Glu Phe Asp Ala Ile Gln Lys Ala Gln Lys Glu Asn Ser Ser	
1755 1760 1765	
tgt act gac aag cga gaa tgg tgg aca ggg cgg ctg gca ctg gac cac	5499
Cys Thr Asp Lys Arg Glu Trp Trp Thr Gly Arg Leu Ala Leu Asp His	
1770 1775 1780 1785	
agg atg gag gtt ctc atc gct tcc cta gag aag tct gtg ctg ggc tgc	5547
Arg Met Glu Val Leu Ile Ala Ser Leu Glu Lys Ser Val Leu Gly Cys	
1790 1795 1800	
tgg aag ggg ctg ctg ctg ccg tcc agt gag gag ccc ggc cct gcc cag	5595
Trp Lys Gly Leu Leu Leu Pro Ser Ser Glu Glu Pro Gly Pro Ala Gln	
1805 1810 1815	
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Glu Ala Ser Arg Leu Gln Glu Leu Gln Asp Cys Gly Trp Lys Tyr	
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Pro Asp Arg Thr Leu Leu Lys Ile Met Leu Ser Gly Ala Gly Ala Leu	
1835 1840 1845	
acc cct cag gac att cag gcc ctg gcc tac ggg ctg tgc cca acc cag	5739
Thr Pro Gln Asp Ile Gln Ala Leu Ala Tyr Gly Leu Cys Pro Thr Gln	
1850 1855 1860 1865	
cca gag cga gcc cag gag ctc ctg aat gag gca gta gga cgt cta cag	5787
Pro Glu Arg Ala Gln Glu Leu Leu Asn Glu Ala Val Gly Arg Leu Gln	
1870 1875 1880	
ggc ctg aca gta cca agc aat agc cac ctt gtc ttg gtc cta gac aag	5835
Gly Leu Thr Val Pro Ser Asn Ser His Leu Val Leu Val Leu Asp Lys	
1885 1890 1895	
gac ttg cag aag ctg ccg tgg gaa agc atg ccc agc ctc caa gca ctg	5883
Asp Leu Gln Lys Leu Pro Trp Glu Ser Met Pro Ser Leu Gln Ala Leu	
1900 1905 1910	
cct gtc acc cgg ctg ccc tcc ttc cgc ttc cta ctc agc tac tcc atc	5931
Pro Val Thr Arg Leu Pro Ser Phe Arg Phe Leu Leu Ser Tyr Ser Ile	
1915 1920 1925	
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Ile Lys Glu Tyr Gly Ala Ser Pro Val Leu Ser Gln Gly Val Asp Pro	
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Arg Ser Thr Phe Tyr Val Leu Asn Pro His Asn Asn Leu Ser Ser Thr	
1950 1955 1960	
gag gag caa ttt cga gcc aat ttc agc agt gaa gct ggc tgg aga gga	6075
Glu Glu Gln Phe Arg Ala Asn Phe Ser Ser Glu Ala Gly Trp Arg Gly	
1965 1970 1975	
gtg gtt ggg gag gtg cca aga cct gaa cag gtg cag gaa gcc ctg aca	6123

Val	Val	Gly	Glu	Val	Pro	Arg	Pro	Glu	Gln	Val	Gln	Glu	Ala	Leu	Thr	
	1980						1985					1990				
aag	cat	gat	ttg	tat	atc	tat	gca	ggg	cat	ggg	gct	ggg	gcc	cgc	ttc	6171
Lys	His	Asp	Leu	Tyr	Ile	Tyr	Ala	Gly	His	Gly	Ala	Gly	Ala	Arg	Phe	
	1995					2000				2005						
ctt	gat	ggg	cag	gct	gtc	ctg	cgg	ctg	agc	tgt	cgg	gca	gtg	gcc	ctg	6219
Leu	Asp	Gly	Gln	Ala	Val	Leu	Arg	Leu	Ser	Cys	Arg	Ala	Val	Ala	Leu	
	2010				2015					2020					2025	
ctg	ttt	ggc	tgt	agc	agt	gcg	gcc	ctg	gct	gtg	cat	gga	aac	ctg	gag	6267
Leu	Phe	Gly	Cys	Ser	Ser	Ala	Ala	Leu	Ala	Val	His	Gly	Asn	Leu	Glu	
			2030							2035				2040		
ggg	gct	ggc	atc	gtg	ctc	aag	tac	atc	atg	gct	ggg	tgc	ccc	ttg	ttt	6315
Gly	Ala	Gly	Ile	Val	Leu	Lys	Tyr	Ile	Met	Ala	Gly	Cys	Pro	Leu	Phe	
			2045					2050					2055			
ctg	ggg	aat	ctc	tgg	gat	gtg	act	gac	cgc	gac	att	gac	cgc	tac	acg	6363
Leu	Gly	Asn	Leu	Trp	Asp	Val	Thr	Asp	Arg	Asp	Ile	Asp	Arg	Tyr	Thr	
	2060					2065					2070					
gaa	gct	ctg	ctg	caa	ggc	tgg	ctt	gga	gca	ggc	cca	ggg	gcc	ccc	ctt	6411
Glu	Ala	Leu	Leu	Gln	Gly	Trp	Leu	Gly	Ala	Gly	Pro	Gly	Ala	Pro	Leu	
	2075					2080					2085					
ctc	tac	tat	gta	aac	cag	gcc	cgc	caa	gct	ccc	cga	ctc	aag	tat	ctt	6459
Leu	Tyr	Tyr	Val	Asn	Gln	Ala	Arg	Gln	Ala	Pro	Arg	Leu	Lys	Tyr	Leu	
	2090				2095					2100					2105	
att	ggg	gct	gca	cct	ata	gcc	tat	ggc	ttg	cct	gtc	tct	ctg	cgg	taa	6507
Ile	Gly	Ala	Ala	Pro	Ile	Ala	Tyr	Gly	Leu	Pro	Val	Ser	Leu	Arg		
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ccccatggag	ctgtcttatt	gatgctagaa	gcctcataac	tgttctacct	ccaagggttag											6567
atttaatcct	taggataact	cttttaaagt	gattttcccc	agtgttttat	atgaaacatt											6627
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 Lys Glu Ala Glu Glu Leu Leu Pro Asp Leu Lys Glu Phe Leu Ser Asn
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 Pro Pro Ala Gly Phe Pro Ser Ser Arg Ser Asp Ala Glu Arg Arg Gln
 35 40 45
 Ala Cys Asp Ala Ile Leu Arg Ala Cys Asn Gln Gln Leu Thr Ala Lys
 50 55 60

Leu	Ala	Cys	Pro	Arg	His	Leu	Gly	Ser	Leu	Leu	Glu	Leu	Ala	Glu	Leu	
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Ala	Cys	Asp	Gly	Tyr	Leu	Val	Ser	Thr	Pro	Gln	Arg	Pro	Pro	Leu	Tyr	
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Leu	Glu	Arg	Ile	Leu	Phe	Val	Leu	Leu	Arg	Asn	Ala	Ala	Ala	Gln	Gly	
			100					105						110		
Ser	Pro	Glu	Val	Thr	Leu	Arg	Leu	Ala	Gln	Pro	Leu	His	Ala	Cys	Leu	
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Val	Gln	Cys	Ser	Arg	Glu	Ala	Ala	Pro	Gln	Asp	Tyr	Glu	Ala	Val	Ala	
	130					135					140					
Arg	Gly	Ser	Phe	Ser	Leu	Leu	Trp	Lys	Gly	Ala	Glu	Ala	Leu	Leu	Glu	
145					150					155					160	
Arg	Arg	Ala	Ala	Phe	Ala	Ala	Arg	Leu	Lys	Ala	Leu	Ser	Phe	Leu	Val	
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Leu	Leu	Glu	Asp	Glu	Ser	Thr	Pro	Cys	Glu	Val	Pro	His	Phe	Ala	Ser	
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Pro	Thr	Ala	Cys	Arg	Ala	Val	Ala	Ala	His	Gln	Leu	Phe	Asp	Ala	Ser	
		195					200					205				
Gly	His	Gly	Leu	Asn	Glu	Ala	Asp	Ala	Asp	Phe	Leu	Asp	Asp	Leu	Leu	
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Ser	Arg	His	Val	Ile	Arg	Ala	Leu	Val	Gly	Glu	Arg	Gly	Ser	Ser	Ser	
225					230					235					240	
Gly	Leu	Leu	Ser	Pro	Gln	Arg	Ala	Leu	Cys	Leu	Leu	Glu	Leu	Thr	Leu	
				245					250					255		
Glu	His	Cys	Arg	Arg	Phe	Cys	Trp	Ser	Arg	His	His	Asp	Lys	Ala	Ile	
			260					265					270			
Ser	Ala	Val	Glu	Lys	Ala	His	Ser	Tyr	Leu	Arg	Asn	Thr	Asn	Leu	Ala	
		275					280					285				
Pro	Ser	Leu	Gln	Leu	Cys	Gln	Leu	Gly	Val	Lys	Leu	Leu	Gln	Val	Gly	
	290					295					300					
Glu	Glu	Gly	Pro	Gln	Ala	Val	Ala	Lys	Leu	Leu	Ile	Lys	Ala	Ser	Ala	
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Val	Leu	Ser	Lys	Ser	Met	Glu	Ala	Pro	Ser	Pro	Pro	Leu	Arg	Ala	Leu	
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Tyr	Glu	Ser	Cys	Gln	Phe	Phe	Leu	Ser	Gly	Leu	Glu	Arg	Gly	Thr	Lys	
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Arg	Arg	Tyr	Arg	Leu	Asp	Ala	Ile	Leu	Ser	Leu	Phe	Ala	Phe	Leu	Gly	
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Gly	Tyr	Cys	Ser	Leu	Leu	Gln	Gln	Leu	Arg	Asp	Asp	Gly	Val	Tyr	Gly	
	370					375					380					

Gly	Ser	Ser	Lys	Gln	Gln	Gln	Ser	Phe	Leu	Gln	Met	Tyr	Phe	Gln	Gly	385	390	395	400
Leu	His	Leu	Tyr	Thr	Val	Val	Val	Tyr	Asp	Phe	Ala	Gln	Gly	Cys	Gln	405	410		415
Ile	Val	Asp	Leu	Ala	Asp	Leu	Thr	Gln	Leu	Val	Asp	Ser	Cys	Lys	Ser	420	425		430
Thr	Val	Val	Trp	Met	Leu	Glu	Ala	Leu	Glu	Gly	Leu	Ser	Gly	Gln	Glu	435	440		445
Leu	Thr	Asp	His	Met	Gly	Met	Thr	Ala	Ser	Tyr	Thr	Ser	Asn	Leu	Ala	450	455		460
Tyr	Ser	Phe	Tyr	Ser	His	Lys	Leu	Tyr	Ala	Glu	Ala	Cys	Ala	Ile	Ser	465	470	475	480
Glu	Pro	Leu	Cys	Gln	His	Leu	Gly	Leu	Val	Lys	Pro	Gly	Thr	Tyr	Pro	485	490		495
Glu	Val	Pro	Pro	Glu	Lys	Leu	His	Arg	Cys	Phe	Arg	Leu	Gln	Val	Glu	500	505		510
Ser	Leu	Lys	Lys	Leu	Gly	Lys	Gln	Ala	Gln	Gly	Cys	Lys	Met	Val	Ile	515	520		525
Leu	Trp	Leu	Ala	Ala	Leu	Gln	Pro	Cys	Ser	Pro	Glu	His	Met	Ala	Glu	530	535		540
Pro	Val	Thr	Phe	Trp	Val	Arg	Val	Lys	Met	Asp	Ala	Ala	Arg	Ala	Gly	545	550	555	560
Asp	Lys	Glu	Leu	Gln	Leu	Lys	Thr	Leu	Arg	Asp	Ser	Leu	Ser	Gly	Trp	565	570		575
Asp	Pro	Glu	Thr	Leu	Ala	Leu	Leu	Leu	Arg	Glu	Glu	Leu	Gln	Ala	Tyr	580	585		590
Lys	Ala	Val	Arg	Ala	Asp	Thr	Gly	Gln	Glu	Arg	Phe	Asn	Ile	Ile	Cys	595	600		605
Asp	Leu	Leu	Glu	Leu	Ser	Pro	Glu	Glu	Thr	Pro	Ala	Gly	Ala	Trp	Ala	610	615		620
Arg	Ala	Thr	His	Leu	Val	Glu	Leu	Ala	Gln	Val	Leu	Cys	Tyr	His	Asp	625	630	635	640
Phe	Thr	Gln	Gln	Thr	Asn	Cys	Ser	Ala	Leu	Asp	Ala	Ile	Arg	Glu	Ala	645	650		655
Leu	Gln	Leu	Leu	Asp	Ser	Val	Arg	Pro	Glu	Ala	Gln	Ala	Arg	Asp	Gln	660	665		670
Leu	Leu	Asp	Asp	Lys	Ala	Gln	Ala	Leu	Leu	Trp	Leu	Tyr	Ile	Cys	Thr	675	680		685
Leu	Glu	Ala	Lys	Ile	Gln	Glu	Gly	Ile	Glu	Arg	Asp	Arg	Arg	Ala	Gln	690	695		700

Ala	Pro	Gly	Asn	Leu	Glu	Glu	Phe	Glu	Val	Asn	Asp	Leu	Asn	Tyr	Glu
705					710					715					720
Asp	Lys	Leu	Gln	Glu	Asp	Arg	Phe	Leu	Tyr	Ser	Asn	Ile	Ala	Phe	Asn
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Leu	Ala	Ala	Asp	Ala	Ala	Gln	Ser	Lys	Cys	Leu	Asp	Gln	Ala	Leu	Ala
			740					745					750		
Leu	Trp	Lys	Glu	Leu	Leu	Thr	Lys	Gly	Gln	Ala	Pro	Ala	Val	Arg	Cys
		755					760					765			
Leu	Gln	Gln	Thr	Ala	Ala	Ser	Leu	Gln	Ile	Leu	Ala	Ala	Leu	Tyr	Gln
	770					775					780				
Leu	Val	Ala	Lys	Pro	Met	Gln	Ala	Leu	Glu	Val	Leu	Leu	Leu	Leu	Arg
785					790					795					800
Ile	Val	Ser	Glu	Arg	Leu	Lys	Asp	His	Ser	Lys	Ala	Ala	Gly	Ser	Ser
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Cys	His	Ile	Thr	Gln	Leu	Leu	Leu	Thr	Leu	Gly	Cys	Pro	Ser	Tyr	Ala
			820					825					830		
Gln	Leu	His	Leu	Glu	Glu	Ala	Ala	Ser	Ser	Leu	Lys	His	Leu	Asp	Gln
		835					840					845			
Thr	Thr	Asp	Thr	Tyr	Leu	Leu	Leu	Ser	Leu	Thr	Cys	Asp	Leu	Leu	Arg
	850					855					860				
Ser	Gln	Leu	Tyr	Trp	Thr	His	Gln	Lys	Val	Thr	Lys	Gly	Val	Ser	Leu
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Leu	Leu	Ser	Val	Leu	Arg	Asp	Pro	Ala	Leu	Gln	Lys	Ser	Ser	Lys	Ala
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Trp	Tyr	Leu	Leu	Arg	Val	Gln	Val	Leu	Gln	Leu	Val	Ala	Ala	Tyr	Leu
		900						905					910		
Ser	Leu	Pro	Ser	Asn	Asn	Leu	Ser	His	Ser	Leu	Trp	Glu	Gln	Leu	Cys
		915					920					925			
Ala	Gln	Gly	Trp	Gln	Thr	Pro	Glu	Ile	Ala	Leu	Ile	Asp	Ser	His	Lys
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Thr	Gln	Lys	Ala	Ala	Val	Glu	Thr	Ser	Phe	Leu	Asp	Tyr	Gly	Glu	Asn
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Lys	Leu	Val	Cys	His	Leu	Gly	Arg	Leu	Gly	Ser	Val	Ser	Glu	Ala	Lys
		995					1000					1005			
Ala	Phe	Cys	Leu	Glu	Ala	Leu	Lys	Leu	Thr	Thr	Lys	Leu	Gln	Ile	Pro
	1010					1015					1020				

Arg Gln Cys Ala Leu Phe Leu Val Leu Lys Gly Glu Leu Glu Leu Ala
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Arg Asn Asp Ile Asp Leu Cys Gln Ser Asp Leu Gln Gln Val Leu Phe
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Leu Leu Glu Ser Cys Thr Glu Phe Gly Gly Val Thr Gln His Leu Asp
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Ser Val Lys Lys Val His Leu Gln Lys Gly Lys Gln Gln Ala Gln Val
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Ala Leu Glu Leu Val Ala Thr Val Ala Lys Glu Pro Gly Pro Ile Ala
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Pro Ser Thr Asn Ser Ser Pro Val Leu Lys Thr Lys Pro Gln Pro Ile
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Pro Asn Phe Leu Ser His Ser Pro Thr Cys Asp Cys Ser Leu Cys Ala
1140 1145 1150

Ser Pro Val Leu Thr Ala Val Cys Leu Arg Trp Val Leu Val Thr Ala
1155 1160 1165

Gly Val Arg Leu Ala Met Gly His Gln Ala Gln Gly Leu Asp Leu Leu
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Gln Val Val Leu Lys Gly Cys Pro Glu Ala Ala Glu Arg Leu Thr Gln
1185 1190 1195 1200

Ala Leu Gln Ala Ser Leu Asn His Lys Thr Pro Pro Ser Leu Val Pro
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Ser Leu Leu Asp Glu Ile Leu Ala Gln Ala Tyr Thr Leu Leu Ala Leu
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Glu Gly Leu Asn Gln Pro Ser Asn Glu Ser Leu Gln Lys Val Leu Gln
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Ser Gly Leu Lys Phe Val Ala Ala Arg Ile Pro His Leu Glu Pro Trp
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Arg Ala Ser Leu Leu Leu Ile Trp Ala Leu Thr Lys Leu Gly Gly Leu
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Ser Cys Cys Thr Thr Gln Leu Phe Ala Ser Ser Trp Gly Trp Gln Pro
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Pro Leu Ile Lys Ser Val Pro Gly Ser Glu Pro Ser Lys Thr Gln Gly
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Gln Lys Arg Ser Gly Arg Gly Arg Gln Lys Leu Ala Ser Ala Pro Leu
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Cys Thr Pro Lys Pro Pro Asp Arg Ile Arg Gln Ala Gly Pro His Val
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Pro Phe Thr Val Phe Glu Glu Val Cys Pro Thr Glu Ser Lys Pro Glu
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Val Pro Gln Ala Pro Arg Val Gln Gln Arg Val Gln Thr Arg Leu Lys
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Val Asn Phe Ser Asp Asp Ser Asp Leu Glu Asp Pro Val Ser Ala Glu
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Arg Gly Arg Ala Arg Lys Gly Leu Ser Leu Lys Thr Asp Ala Val Val
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Ala Pro Gly Ser Ala Pro Gly Asn Pro Gly Leu Asn Gly Arg Ser Arg
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Arg Ala Lys Lys Val Ala Ser Arg His Cys Glu Glu Arg Arg Pro Gln
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Arg Ala Ser Asp Gln Ala Arg Pro Gly Pro Glu Ile Met Arg Thr Ile
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Pro Glu Glu Glu Leu Thr Asp Asn Trp Arg Lys Met Ser Phe Glu Ile
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Asp Ser Ser Lys Lys Lys Leu Pro Ser Pro Cys Pro Asp Lys Glu Ser
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Asp Lys Asp Leu Gly Pro Arg Leu Gln Leu Pro Ser Ala Pro Val Ala
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Thr Gly Leu Ser Thr Leu Asp Ser Ile Cys Asp Ser Leu Ser Val Ala
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Phe Arg Gly Ile Ser His Cys Pro Pro Ser Gly Leu Tyr Ala His Leu
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Cys Arg Phe Leu Ala Leu Cys Leu Gly His Arg Asp Pro Tyr Ala Thr
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Ala Phe Leu Val Thr Glu Ser Val Ser Ile Thr Cys Arg His Gln Leu
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Leu Thr His Leu His Arg Gln Leu Ser Lys Ala Gln Lys His Arg Gly
1635 1640 1645

Ser Leu Glu Ile Ala Asp Gln Leu Gln Gly Leu Ser Leu Gln Glu Met
1650 1655 1660

Pro Gly Asp Val Pro Leu Ala Arg Ile Gln Arg Leu Phe Ser Phe Arg

1665	1670	1675	1680
Ala Leu Glu Ser Gly	His Phe Pro Gln Pro	Glu Lys Glu Ser Phe Gln	
1685	1690	1695	
Glu Arg Leu Ala Leu	Ile Pro Ser Gly Val	Thr Val Cys Val Leu Ala	
1700	1705	1710	
Leu Ala Thr Leu Gln	Pro Gly Thr Val Gly	Asn Thr Leu Leu Leu Thr	
1715	1720	1725	
Arg Leu Glu Lys Asp	Ser Pro Pro Val Ser	Val Gln Ile Pro Thr Gly	
1730	1735	1740	
Gln Asn Lys Leu His	Leu Arg Ser Val Leu	Asn Glu Phe Asp Ala Ile	
1745	1750	1755	1760
Gln Lys Ala Gln Lys	Glu Asn Ser Ser Cys	Thr Asp Lys Arg Glu Trp	
1765	1770	1775	
Trp Thr Gly Arg Leu	Ala Leu Asp His Arg	Met Glu Val Leu Ile Ala	
1780	1785	1790	
Ser Leu Glu Lys Ser	Val Leu Gly Cys Trp	Lys Gly Leu Leu Leu Pro	
1795	1800	1805	
Ser Ser Glu Glu Pro	Gly Pro Ala Gln Glu	Ala Ser Arg Leu Gln Glu	
1810	1815	1820	
Leu Leu Gln Asp Cys	Gly Trp Lys Tyr Pro	Asp Arg Thr Leu Leu Lys	
1825	1830	1835	1840
Ile Met Leu Ser Gly	Ala Gly Ala Leu Thr	Pro Gln Asp Ile Gln Ala	
1845	1850	1855	
Leu Ala Tyr Gly Leu	Cys Pro Thr Gln Pro	Glu Arg Ala Gln Glu Leu	
1860	1865	1870	
Leu Asn Glu Ala Val	Gly Arg Leu Gln Gly	Leu Thr Val Pro Ser Asn	
1875	1880	1885	
Ser His Leu Val Leu	Val Leu Asp Lys Asp	Leu Gln Lys Leu Pro Trp	
1890	1895	1900	
Glu Ser Met Pro Ser	Leu Gln Ala Leu Pro	Val Thr Arg Leu Pro Ser	
1905	1910	1915	1920
Phe Arg Phe Leu Leu	Ser Tyr Ser Ile Ile	Lys Glu Tyr Gly Ala Ser	
1925	1930	1935	
Pro Val Leu Ser Gln	Gly Val Asp Pro Arg	Ser Thr Phe Tyr Val Leu	
1940	1945	1950	
Asn Pro His Asn Asn	Leu Ser Ser Thr Glu	Glu Gln Phe Arg Ala Asn	
1955	1960	1965	
Phe Ser Ser Glu Ala	Gly Trp Arg Gly Val	Val Gly Glu Val Pro Arg	
1970	1975	1980	
Pro Glu Gln Val Gln	Glu Ala Leu Thr Lys	His Asp Leu Tyr Ile Tyr	

1985	1990	1995	2000
Ala Gly His Gly	Ala Gly Ala Arg Phe Leu Asp Gly Gln Ala Val Leu		
2005	2010	2015	
Arg Leu Ser Cys Arg	Ala Val Ala Leu Leu Phe Gly Cys Ser Ser Ala		
2020	2025	2030	
Ala Leu Ala Val His Gly Asn Leu Glu Gly Ala Gly Ile Val Leu Lys			
2035	2040	2045	
Tyr Ile Met Ala Gly Cys Pro Leu Phe Leu Gly Asn Leu Trp Asp Val			
2050	2055	2060	
Thr Asp Arg Asp Ile Asp Arg Tyr Thr Glu Ala Leu Leu Gln Gly Trp			
2065	2070	2075	2080
Leu Gly Ala Gly Pro Gly Ala Pro Leu Leu Tyr Tyr Val Asn Gln Ala			
2085	2090	2095	
Arg Gln Ala Pro Arg Leu Lys Tyr Leu Ile Gly Ala Ala Pro Ile Ala			
2100	2105	2110	
Tyr Gly Leu Pro Val Ser Leu Arg			
2115	2120		

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